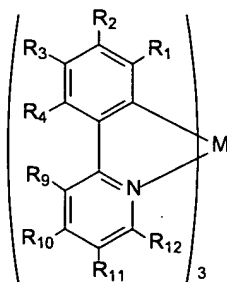


WHAT IS CLAIMED IS:

1. An organic light emitting device comprising an array of pixels, wherein each pixel comprises an emissive layer comprising a phosphorescent emissive material, and wherein the pixel shrinkage is less than about 10 %area when operated at about 10 mA/cm² constant dc current for at least 1000 hours at room temperature.
2. The organic light emitting device of claim 1, wherein the array of pixels is defined by a grid.
3. The organic light emitting device of claim 2, wherein the grid comprises a negative photo-resist material.
4. The organic light emitting device of claim 2, wherein the grid comprises a positive photo-resist material.
5. The organic light emitting device of claim 1, wherein the emissive layer comprises a phosphorescent emissive material of the formula VII



VII

M is a metal atom;

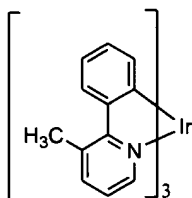
each R¹, R², R³, R⁴, R⁹, R¹⁰, R¹¹, and R¹² is, independently, H, F, Cl, Br, I, R, OR, N(R)₂, SR, C(O)R, C(O)OR, C(O)N(R)₂, CN, NO₂, SO₂, SOR, SO₂R, SO₃R; and additionally, or alternatively, any one or more of R¹ and R², or R² and R³, or R³ and R⁴, or R⁹ and R¹⁰, or R¹⁰ and R¹¹, or R¹¹ and R¹², together form, independently, a fused 4- to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl, and wherein said cyclic group is optionally substituted by one or more substituents X;

each R is, independently, H, C₁-C₂₀ alkyl, C₂-C₂₀ alkenyl, C₂-C₂₀ alkynyl, C₁-C₂₀ heteroalkyl, C₅-C₄₀ aryl, C₅-C₄₀ heteroaryl, aralkyl; wherein R is optionally substituted by one or more substituents X;

each X is, independently, H, F, Cl, Br, I, R', O R', N(R')₂, SR', C(O)R', C(O)OR', C(O)N(R')₂, CN, NO₂, SO₂, SOR', SO₂R', or SO₃R';

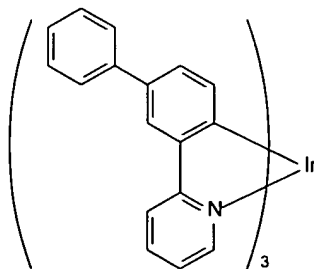
each R' is, independently, H, C₁-C₂₀ alkyl, C₁-C₂₀ perhaloalkyl C₂-C₂₀ alkenyl, C₂-C₂₀ alkynyl, C₁-C₂₀ heteroalkyl, C₅-C₄₀ aryl, or C₅-C₄₀ heteroaryl; and wherein at least one of R¹, R², R³, R⁴, R⁹, R¹⁰, R¹¹, and R¹² is not H.

6. The organic light emitting device of claim 5, wherein the emissive layer comprises a phosphorescent emissive material of the formula



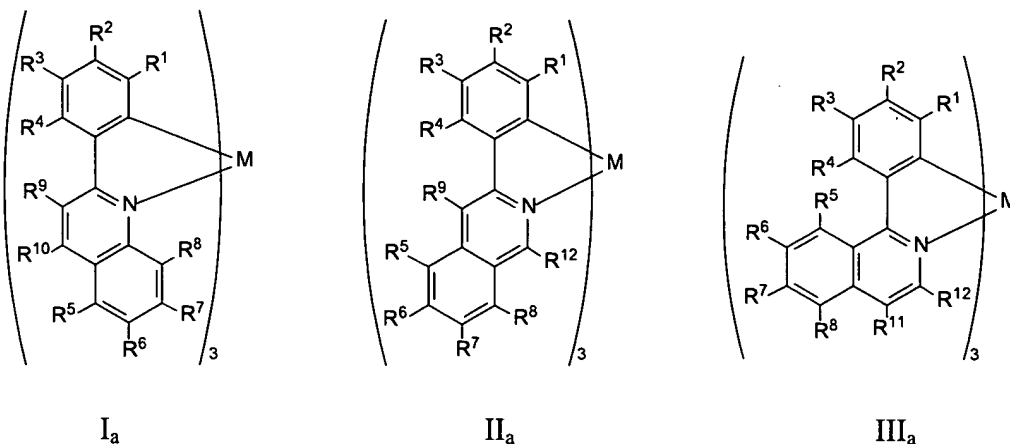
7. The organic light emitting device of claim 5, wherein the emissive layer comprises a phosphorescent emissive material of the formula VII wherein at least one of R¹, R², R³, R⁴, R⁹, R¹⁰, R¹¹, and R¹² is aryl or heteroaryl.

8. The organic light emitting device of claim 5, wherein the emissive layer comprises a phosphorescent emissive material of the formula



9. The organic light emitting device of claim 5, wherein the emissive layer comprises a phosphorescent emissive material of the formula VII wherein at least one of R¹ and R², or R²

- and R^3 , or R^3 and R^4 , or R^9 and R^{10} , or R^{10} and R^{11} , or R^{11} and R^{12} , together form, independently, a fused 5-and 6-member cyclic group.
10. The organic light emitting device of claim 5, wherein the emissive layer comprises a phosphorescent emissive material of the formula VII wherein M is Ir.
 11. The organic light emitting device of claim 5, wherein the emissive layer comprises an emissive material of the formula VII wherein at least one of R^1 and R^2 , or R^2 and R^3 , or R^3 and R^4 , or R^9 and R^{10} , or R^{10} and R^{11} , or R^{11} and R^{12} , together form, independently, a fused 5-and 6-member cyclic group.
 12. The organic light emitting device of claim 5, wherein the array of pixels is defined by a grid.
 13. The organic light emitting device of claim 12, wherein the grid comprises a negative photoresist material.
 14. The organic light emitting device of claim 12, wherein the grid comprises a positive photoresist material.
 15. The organic light emitting device of claim 5, wherein the pixel shrinkage is less than about 5 μm when operated at about 10mA/cm² constant dc current for at least 1000 hours at room temperature.
 16. The organic light emitting device of claim 5, wherein the array of pixels has a pixel pitch of less than about 500 μm .
 17. The organic light emitting device of claim 1, wherein the emissive layer comprises a phosphorescent emissive material of the formula I_a, II_a, or III_a



M is a metal atom;

each R¹, R², R³, R⁴, R⁵, R⁶, R⁷, R⁸, R⁹, R¹⁰, R¹¹ and R¹² is, independently, H, F, Cl, Br, I, R, OR, N(R)₂, SR, C(O)R, C(O)OR, C(O)N(R)₂, CN, NO₂, SO₂, SOR, SO₂R, SO₃R; and additionally, or alternatively, any one or more of R¹ and R², or R² and R³, or R³ and R⁴, or R⁵ and R⁶, or R⁶ and R⁷, or R⁷ and R⁸, or R⁹ and R¹⁰, or R¹¹ and R¹², together form, independently, a fused 4- to 7-member cyclic group, wherein said cyclic group is cycloalkyl, cycloheteroalkyl, aryl, or heteroaryl, and wherein said cyclic group is optionally substituted by one or more substituents X;

each R is, independently, H, C₁-C₂₀ alkyl, C₂-C₂₀ alkenyl, C₂-C₂₀ alkynyl, C₁-C₂₀ heteroalkyl, C₅-C₄₀ aryl, C₃-C₄₀ heteroaryl, aralkyl; wherein R is optionally substituted by one or more substituents X;

each X is, independently, H, F, Cl, Br, I, R', OR', N(R')₂, SR', C(O)R', C(O)OR', C(O)N(R')₂, CN, NO₂, SO₂, SOR', SO₂R', or SO₃R'; and

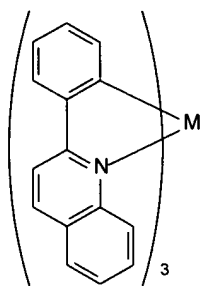
each R' is, independently, H, C₁-C₂₀ alkyl, C₁-C₂₀ perhaloalkyl, C₂-C₂₀ alkenyl, C₂-C₂₀ alkynyl, C₁-C₂₀ heteroalkyl, C₅-C₄₀ aryl, or C₅-C₄₀ heteroaryl.

18. The organic light emitting device of claim 17, wherein the emissive layer comprises a phosphorescent emissive material of the formula I_a, II_a, or III_a wherein M is Ir.
19. The organic light emitting device of claim 17, wherein the emissive layer comprises a phosphorescent emissive material of the formula I_a.

20. The organic light emitting device of claim 17, wherein the emissive layer comprises a phosphorescent emissive material of the formula II_a.

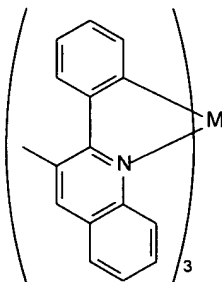
21. The organic light emitting device of claim 17, wherein the emissive layer comprises a phosphorescent emissive material of the formula III_a.

22. The organic light emitting device of claim 19, wherein the emissive layer comprises a phosphorescent emissive material of the formula



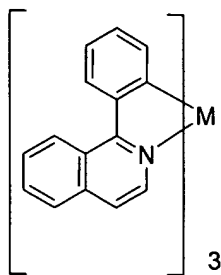
23. The organic light emitting device of claim 22, wherein M is Ir.

24. The organic light emitting device of claim 19, wherein the emissive layer comprises an emissive material of the formula



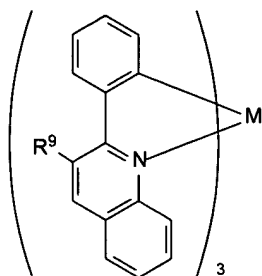
25. The organic light emitting device of claim 24, wherein M is Ir.

26. The organic light emitting device of claim 21, wherein the emissive layer comprises an emissive material of the formula



27. The organic light emitting device of claim 26, wherein M is Ir.
28. The organic light emitting device of claim 17, wherein the pixel shrinkage is less than about 5 μm when operated at about 10 mA/cm^2 constant dc current for at least 1000 hours at room temperature.
29. An organic light emitting device comprising an array of pixels, wherein each pixel comprises an emissive layer comprising a phosphorescent emissive material, and wherein the pixel shrinkage is less than about 10 μm shrinkage when operated at about 10 mA/cm^2 constant dc current for at least 1000 hours at room temperature.
30. The organic light emitting device of claim 29, wherein the pixel shrinkage is less than about 5 μm shrinkage when operated at about 10 mA/cm^2 constant dc current for at least 1000 hours at room temperature.
31. The organic light emitting device of claim 29, wherein the array of pixels is defined by a grid.
32. The organic light emitting device of claim 31, wherein the grid comprises a negative photo-resist material.
33. The organic light emitting device of claim 31, wherein the grid comprises a positive photo-resist material.

34. An organic light emitting device comprising an emissive layer, wherein the emissive layer comprises a phosphorescent emissive material of the formula I_b



I_b

wherein M is a metal;

R⁹ is selected from the group consisting of F, Cl, Br, I, R, OR, N(R)₂, SR, C(O)R, C(O)OR, C(O)N(R)₂, CN, NO₂, SO₂, SOR, SO₂R, SO₃R;

each R is, independently, C₁-C₂₀ alkyl, C₂-C₂₀ alkenyl, C₂-C₂₀ alkynyl, C₁-C₂₀ heteroalkyl, C₅-C₄₀ aryl, C₃-C₄₀ heteroaryl, aralkyl; wherein R is optionally substituted by one or more substituents X;

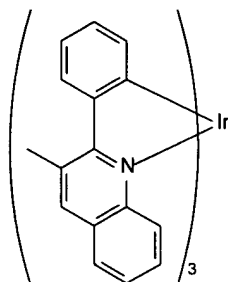
each X is, independently, H, F, Cl, Br, I, R', O R', N(R')₂, SR', C(O)R', C(O)OR', C(O)N(R')₂, CN, NO₂, SO₂, SOR', SO₂R', or SO₃R';

each R' is, independently, H, C₁-C₂₀ alkyl, C₁-C₂₀ perhaloalkyl C₂-C₂₀ alkenyl, C₂-C₂₀ alkynyl, C₁-C₂₀ heteroalkyl, C₅-C₄₀ aryl, or C₅-C₄₀ heteroaryl.

35. The organic light emitting device of claim 34, wherein the emissive layer comprises a phosphorescent emissive material of the formula I_b wherein M is Ir.
36. The organic light emitting device of claim 34, wherein the pixel shrinkage is less than about 10 %area when operated at about 10 mA/cm² constant dc current for at least 1000 hours at room temperature.
37. The organic light emitting device of claim 34, wherein the emissive layer comprises a phosphorescent emissive material of the formula I_b wherein R⁹ is R.

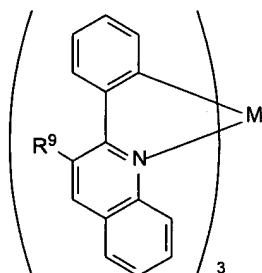
38. The organic light emitting device of claim 34, wherein the emissive layer comprises a phosphorescent emissive material of the formula I_b wherein R⁹ is C₁-C₂₀ alkyl.

39. The organic light emitting device of claim 35, wherein the emissive layer comprises a phosphorescent emissive material of the formula I_c



I_c

40. A compound having the formula I_b



I_b

wherein M is a metal;

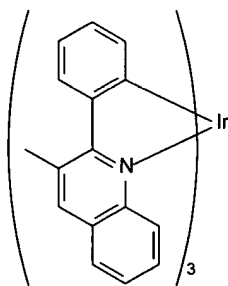
R⁹ is selected from the group consisting of F, Cl, Br, I, R, OR, N(R)₂, SR, C(O)R, C(O)OR, C(O)N(R)₂, CN, NO₂, SO₂, SOR, SO₂R, SO₃R;

each R is, independently, C₁-C₂₀ alkyl, C₂-C₂₀ alkenyl, C₂-C₂₀ alkynyl, C₁-C₂₀ heteroalkyl, C₅-C₄₀ aryl, C₃-C₄₀ heteroaryl, aralkyl; wherein R is optionally substituted by one or more substituents X;

each X is, independently, H, F, Cl, Br, I, R', O R', N(R')₂, SR', C(O)R', C(O)OR', C(O)N(R')₂, CN, NO₂, SO₂, SOR', SO₂R', or SO₃R';

each R' is, independently, H, C₁-C₂₀ alkyl, C₁-C₂₀ perhaloalkyl, C₂-C₂₀ alkenyl, C₂-C₂₀ alkynyl, C₁-C₂₀ heteroalkyl, C₅-C₄₀ aryl, or C₅-C₄₀ heteroaryl.

41. The compound of claim 40, wherein M is Ir.
42. The compound of claim 40, wherein R⁹ is R.
43. The compound of claim 40, wherein R⁹ is C₁-C₂₀ alkyl.
44. The compound of claim 40, having the formula I_c



I_c